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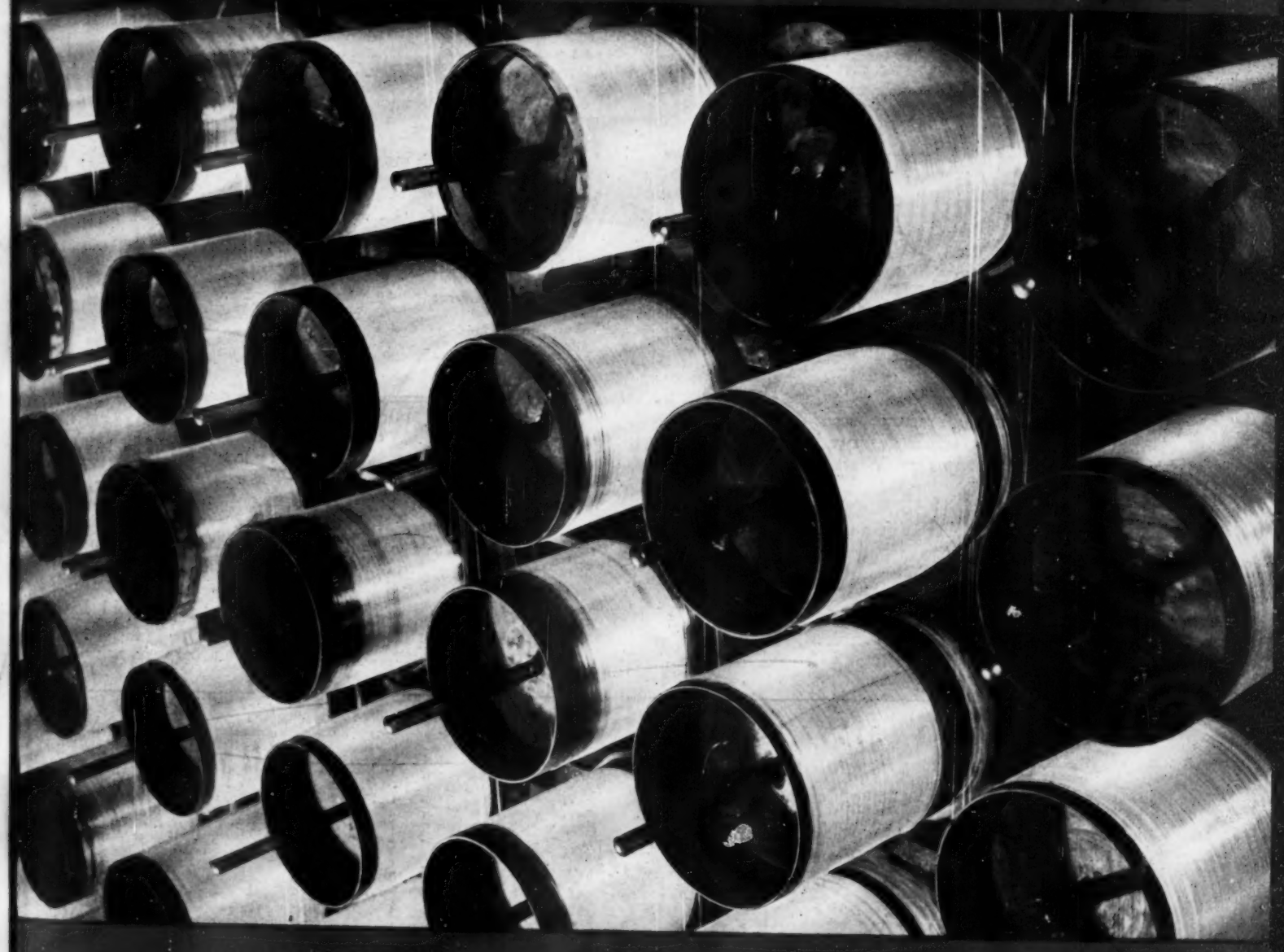
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • OCTOBER 3, 1942



Glass Yarn for War

See Page 217

A SCIENCE SERVICE PUBLICATION

Do You Know?

Oil field brine may prove a valuable source of *magnesium.*

One cord of oak, hickory, hard maple, or yellow birch *fuelwood* is equal in heating value to a ton of anthracite coal.

Flax waste, pressed into briquets and burned, provides a high grade of fuel for motor vehicles, according to Danish experimenters.

One hundred years ago the distance of the *sun* was uncertain to one part in twenty; now it has been reduced to one part in a thousand.

Cacao, source of chocolate and cocoa, is harvested in May in South America, in the transition period between the rainy and the dry seasons.

Experimental packages of *dehydrated foods* are stored for several months under tropical climate conditions, then opened to test the nutritive value and palatability of the contents.

Analysis of the *tastes* of audiences in Mexico's 800 moving picture houses shows a decided preference for swashbuckling adventure stories, Westerns, and Tarzan pictures.

A *portable radio,* whose antenna can be sewn into a coat, enables police officers in one city to keep in touch with headquarters not only while walking beats or riding motorcycles, but while demolishing hamburgers in a restaurant, as well.

Sunflower seeds are substituting in Germany for peanuts and chewing gum, as a confection.

The *engine* of one airplane type is composed of 3,500 different parts, totaling 8,500 individual pieces.

Tenders of new 93-foot locomotives, recently put into service, carry 25 tons of coal and 22,000 gallons of water.

Cobalt has been reported by one experimenter as essential for the forming of hemoglobin in sheep and cattle.

From *peat,* Norwegian experimenters have produced artificial leather, bread flour, gas, and even a kind of wine.

Soldiers at a Colorado airfield have discovered a law making it punishable to shoot *buffalo* out of a barracks window.

Question Box

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Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

SCIENCE NEWS LETTER

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MEDICINE

Cancer Increase Expected

Loss of young men from war casualties will cause a relative increase in age groups susceptible to cancer. Rationing of physicians is predicted.

➤ A RELATIVE increase in cancer death rates and rationing of doctors for civilians may be expected as results of the war, Dr. Samuel Binkley, medical director of the American Society for the Control of Cancer, declared at the national training school for officers of the Women's Field Army of the Society.

The increase in cancer death rates will be misleading, Dr. Binkley warned, unless the age distribution of the population is considered. The loss of young males from war casualties will cause a relative increase in the cancer age group of the general population.

On rationing of doctors for civilians, Dr. Binkley told the WFA that "if the public will look into the future it can help its Government win this war by participating in voluntary health programs.

"Should rationing of physicians become necessary, people may be asked to take their medical problems to a centralized hospital in a community where the remaining local physicians can pool their resources, budget their time and quickly sift serious sickness from simple ailments not entitled to consideration during a war emergency," he said.

"Young mothers are becoming more self-reliant," he continued. "The automatic services of skilled pediatricians cannot be expected in every community during the war. In some communities experienced mothers are already teaching the fundamentals of infant feeding to their daughters and friends who have suddenly lost their physicians to the service.

"A reduction in unnecessary sickness and a better understanding of health will reduce the strain on those physicians who must remain at home. Home accidents due to carelessness and common colds from exposure due to lack of proper clothing at football games are examples of unnecessary demands upon doctors during a war emergency."

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NON-TERRIFYING — Making gas mask wearers look like human beings is the novel idea back of this invention patented by Charles W. Leguillon of the B. F. Goodrich Company. It is made from transparent plastic materials and is impervious to noxious gases, dust and vapors. It also has a design feature that prevents eye lenses from fogging.

Worse Foe to Japs

➤ MEMBERS of the WFA attending their first national officers training school got a lesson on how to fight stomach cancer and learned that this highly fatal disease attacks Japs two or three times as often as white races.

Teacher of this class for officers of the Women's Field Army of the American Society for the Control of Cancer was Dr. George T. Pack, attending surgeon Memorial Hospital, New York.

"Cancer of the stomach occurs two or three times as frequently in the Japanese as it does in the white races, a phenomenon not entirely understood, but highly approved of, at this time," he stated.

The stomach is the most common region of the body for fatal cancer to be located, he said.

The "flagrancy of high pressure salesmanship through the radio and the press by manufacturers of proprietary drugs in order to induce the public to treat its own indigestion" is one of four causes for the high mortality from stomach cancer listed by Dr. Pack.

The other three are the natural high and increasing incidence of this disease; the progress of these cancers to the stage of inoperability before the majority of them are correctly diagnosed; and the difficulties attending surgical removal of cancer in this organ.

In two-thirds of the cases the patients are to blame for "immoderate and fatal delay" in getting a correct diagnosis and early, appropriate treatment. In the other third, Dr. Pack said, it is the fault of the physician first consulted.

On the encouraging side, Dr. Pack pointed out that many cancers of the stomach, formerly considered inoperable and hopeless, are now successfully removed. He reported that in the last two years 16 patients at Memorial Hospital have had the entire stomach removed because of cancer. In this operation, the small intestine is stitched to the esophagus or gullet, and serves as a substitute stomach, enabling the patient to eat normal meals. In most patients, removal of part of the stomach is all that is necessary.

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PHYSICS

One Good Physicist Per Year Per Million Is Bred

➤ ONE GOOD physicist is bred per year per million inhabitants.

This estimate, made by Sir Lawrence Bragg, of Cavendish Laboratory, Cambridge, England, was based on the number of physicists turned out annually by the British universities and is confirmed by the Central Register of the Royal Society, which corresponds to our National Roster (*Nature,* July 18). At the beginning of the war, the British had listed 1,200 physicists in a population of 45,000,000. Assuming an average working life of 30 years, this comes also to about one per million per year.

A survey made in the United States in connection with the National Roster of Scientific and Specialized Personnel shows that one good physicist in a million men applies to the U. S. A., too.

This ranks the physicist among the scarcest of war "materials." The demand in both England and America exceeds the supply, and the universities have been pressed to train as many men as possible to fill the gap.

The physicist, like the poet, is born and not made, an editorial in the London journal *Nature* contends. He

cannot be made on demand by any system of training. However, the British editorial argues, Sir Lawrence Bragg's definition of a good physicist as "a man capable of independent thought, with a flair for his subject," has set the standard too high. Many of the tasks for which physicists are required can be very adequately performed by men and women less gifted.

There has been a very substantial increase in the size of the physics classes in British universities and colleges. While this may not add materially to the numbers of "good physicists" it will add substantially to the numbers available for the more routine but no less important posts for which originality of a high order is not necessary. And this will enable the strictly limited number of men with a real flair for research to be assigned to the tasks which they alone can do.

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EDUCATION

Victory Corps Planned

Enlistment of 6,500,000 girls and boys in secondary schools for voluntary war service training is announced as a national war policy. No uniforms to be worn.

➤ A U. S. HIGH SCHOOL Victory Corps in every high school, enlisting 6,500,000 girls and boys volunteering for war service training, was announced in Washington as a national war policy.

Resulting from recommendations of the U. S. Office of Education's Wartime Commission, the new plan is being urged upon all secondary schools, private and public, by War Manpower Chairman Paul V. McNutt and Commissioner of Education John W. Studebaker, acting through state school systems.

Accelerated special training of youth for war service is the major objective of the High School Victory Corps. Active participation in the community's war effort is another aim.

There will be activities of the HSVC in classrooms and after school hours as well in the nation's 28,000 high schools.

These are among the projected activities:

Guidance of youth into critical services and occupations.

Wartime citizenship training to insure better understanding of the war, its meaning, progress and problems.

Physical fitness.

Voluntary military drill for selected boys.

Competence in science and mathematics.

Pre-flight training in aeronautics for those preparing for air service.

Pre-induction training for critical occupations.

Community service including training for essential civilian activities.

"The high school can't go on doing business as usual," said the Policy Commission's recommendations that brought forth this new plan for high school education. "High School youth are impelled by patriotic considerations to point their training to preparation for war work, to tasks requiring skill of hand and strength of body, coupled with intelligence and devotion."

Every student who will complete high school within two years will have the opportunity of enrolling in one of five divisions: Land Service, Air Service, Sea Service, Production Service, and Community Service.

Special insignia will be worn by the HSVC and each of its divisions. In general, uniforms will not be worn but there will be a special cap of overseas type that may be made at home.

The basic idea of the Victory Corps is the cutting down of the time needed to train men and women after they have enrolled in the armed forces and in war industries. Special pre-induction courses prepared in cooperation with the War Department will bulk large in America's new educational program.

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ASTRONOMY

Mexican Postage Stamps Have Astronomical Theme

By DR. HARLOW SHAPLEY,
Director, Harvard College Observatory

➤ A LIMITED ISSUE of postage stamps portraying astronomical features was issued by Mexico in connection with the dedication of that nation's new astrophysical observatory at Tonanzintla in the State of Puebla this year.

Shown at the extreme left, in the illustration on this page, is the 2-centavo stamp. The dark nebulous cloud be-

tween the belt stars and the sword stars in Orion is sometimes called the Bay Nebula, sometimes the Horsehead. It is a mixture of dark and bright nebulosity, clouds of dust and gas. Distance about a thousand light years.

Next is the 5-centavo stamp showing the total eclipse of the sun. The shape of the corona depends on the time of the eclipse in the sun's eleven-year sunspot period. Recent investigations have indicated that highly ionized atoms of iron, nickel, and calcium are responsible for the brighter radiations of the sun's corona.

At the right is the 10-centavo stamp showing the spiral galaxy in the Hunting Dogs, Messier 51. The spiral is seen face on, and above it is a great gaseous nebulosity, at the end of one of the spiral arms. The system is composed of billions of stars, and the whole group is separating from our somewhat similar galaxy at the rate of about 160 miles a second.

On this page, the first stamp shown, is the 20-centavo stamp. The spiral galaxy NGC 4594 is an enormous flattened system of stars about seven million light years distant. The individual stars cannot be seen with the most powerful telescopes. The spiral is receding from our galactic system with a speed of 700 miles a second—a local indicator of the expansion of the universe. The dark line across the galaxy is produced by clouds of absorbing dust in its Milky Way plane, dust of the same sort that makes the Bay Nebulosity on the 2-centavo stamp.

The 40-centavo stamp, next, shows the famous Ring Nebula in Lyra, visible with a moderate-sized telescope. The Ring apparently is a part of the central star, a great shell of atmosphere that blew off long ago, making the star temporarily a "nova." The four stars outside the Ring belong to the field and have nothing to do with the Nebula.

On the one-peso stamp at the extreme right is what may be one of the first scientific plottings ever to appear on a postage stamp. It is the famous Russell diagram and shows the observed relation between the candlepowers of stars and their surface temperatures, or in other words, between their absolute magnitudes and spectral classes. The sun's place is in the middle of the longer sloping streak—a star of average color and average candlepower.

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ENGINEERING

Save Waste Light

Illumination falling on dark surfaces in war plants must be salvaged for victory. Brighter color contrast may double visibility with same light.

➤ VISIBILITY in factories may be greatly increased, sometimes even doubled, without any change in the lighting system, by the use of high-reflecting paints and contrasting colors. This was described at the meeting of the Illuminating Engineering Society in St. Louis by Arthur A. Brainerd of the Philadelphia Electric Co., and Robert A. Massey of E. I. du Pont de Nemours & Company.

Light which falls on dark walls, floors and ceilings, or escapes to the rafters, is waste light which, along with other industrial wastes, must be salvaged for victory, in the opinion of these engineers.

By painting these surfaces, as well as bench and table tops with light-colored high-reflecting paints, this light may bounce from the surfaces many times and thus be used several times over. By making these changes in a small test room, the visibility was increased from an original 27% to 55%, a 100%-improvement. Similar changes made in a number of factories gave very satisfactory results, it was reported.

Particularly important is a ceiling under the rafters. A light colored floor also adds visibility to all sides of a machine.

These background colors should be weak colors, such as horizon gray, and cream, the engineers said. Also they should be matt or dull finish, since it is the diffuse light that makes objects visible.

Since surroundings will be bright, color contrast must be relied on, rather than brightness contrast, to bring out the machinery and work. These colors must be stronger than the background colors, but not too strong, for strong colors fatigue the eye. Rather they should be

HONORING ASTRONOMY — ***Mexico has issued this series of stamps of particular astronomical interest. The meaning of the stamps is described in the article on this page.***

pastel shades, colors that are easy to live with all day.

Two colors very suitable for this purpose are "Spotlight Buff" and "Spotlight Green," the engineers have found. These "spotlight" colors provide what they call "three-dimensional seeing." This system has received warm praise in the factories where it has been applied. The seeing was not only better, but pleasant and restful to the eyes.

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PSYCHOLOGY

Work—But Not for Pay

War-lonely women, emotionally stranded when their husbands go to war, are advised to volunteer for a war job, but if possible to refuse wages.

➤ WAR-LONELY WOMEN who don't need work, but who want to get a war job as a means of forgetting their troubles are advised to volunteer for work with the Red Cross, OCD or some similar job without pay. This counsel comes from a Washington psychiatrist familiar with the problems of war-hit women, Dr. Benjamin Karpman, of St. Elizabeths Hospital, in Washington, D. C.

"A woman who accepts work at a salary may have her time well occupied while she is on her job," Dr. Karpman said. "But when she goes home at the end of the day to her empty room, the pain of separation from her sweetheart, her husband or her son returns. She is emotionally stranded."

"If, however, she can feel that she is giving of her time, her strength and her life for the winning of the war in just the same way as is the man she loves, she is building a tie between them that the miles of distance can never destroy. This dissipates her anxiety."

The plight of the "girl he left behind" is a serious one from the standpoint of mental health, Dr. Karpman emphasized. It is especially hard for the young war bride whose husband has gone to the front.

The painful loneliness of the emotionally-stranded woman is built up by the continual denial of the instincts normally satisfied in married life. A woman's instinct, Dr. Karpman explained, is like a negative electrical potential. Electricity cannot flow until the negative charge finds a path to a corresponding positive charge. In very much the same way, a woman's unsatisfied love builds up a potential of emotion which cannot be dissipated until she is re-united with her husband.

If, however, the lonely woman can find a "cause" or an occupation that she more or less unconsciously links in her heart with the absent loved one, she can lavish on her work the emotional energy that is pent up within her. This sort of substitute for normal family life can never quite take the place of the real thing, but it will give a lot of satisfaction, especially if it is work that is generally considered worth while and necessary.

The same satisfaction is obviously not found in a job for which payment is taken. This involves no sacrifice — no labor of love—it becomes a mere exchange of time for money without investment of emotion.

A young girl who has not yet found a permanent attachment may be lonely, too, with so many boys gone to camp or away to war production jobs. But she can always hope for her Prince Charming to come to her, perhaps in the person of some soldier home on furlough. Meantime, she can find diversion in dancing or going to the movies with whatever boys may come and go in her neighborhood.

But whenever a young woman accepts the courtship of a man, somewhere back in her mind, perhaps unconsciously or perhaps half-consciously, is the hope that it may realize itself in marriage. Going out with a stray young man takes away that hope and, therefore, she doesn't get as much satisfaction from her diversions as she would otherwise.

It must also be remembered that as a majority of the younger men are disappearing, the proportion of women keeps increasing, and the opportunities for going out with the opposite sex are proportionately decreasing.

Such diversions are not possible, however, to the woman who has already found her Prince Charming and married him. She has had, perhaps, a few blissful weeks or months of happy married life and then when he went to war she was left with an emptiness in her heart which only he can fill.

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GEOLOGY

Oil For Alaska Highway

➤ AVIATION GASOLINE and diesel engine oil will soon be flowing through a new pipeline toward the Alaska highway from oil wells and the world's most northern refinery at Fort Norman on the Mackenzie River in Canada 125 miles south of the Arctic Circle. Vast untapped tar sands in northern Alberta are being mined for oil, gasoline, asphalt and coke.

The wells at Fort Norman have been in existence since 1921. They were little used, however, in fact were capped until 1930, when discovery of radium on Great Bear Lake shores brought aerial prospectors in vast numbers. Shortly after the outbreak of war a new refinery was built at Fort Norman producing aviation gasoline and diesel engine oil. This plant, according to Munitions and Supply Minister C. D. Howe, has now been expanded, and will likely be in use for a longer period than just during the summer, as it has since installation.

"An intensive study of the tar sands is under way at present time," stated Minister Howe, in Parliament. "Today we think of that area as a source of immediate oil production, provided the problems connected with its development can be solved rapidly and with some degree of certainty. Arrangements have been made to develop further the wells on the lower Mackenzie River at Fort Norman. Additional wells are being drilled, the refinery capacity is being increased, and a short pipeline is being installed to bring the oil across to the location of the Alaska highway."

From the sands along the Athabasca River in Northern Alberta, Indians have since time immemorial used pitch to caulk their canoes. The first white man to come into the area in 1788 found the oil sands to stretch for miles, in some places found oil bubbling to the surface. Since the settlement of Alberta many attempts have been made to obtain oil

from these oil-rich sands. Last year the first successful commercial extraction plant began operations to obtain lubricating oil and gasoline from the tar sands.

The oil sands along the Athabasca River are considered by oil authorities to be one of the largest oil reservoirs in the world. According to Canadian government geological estimates, the oil sands contain at least one hundred billion barrels of oil. But it will be a big job to get it out.

Because of transportation difficulties and because no suitable extraction system had been devised, the oil sands remained unworked. These oil-saturated sands range in thickness from a few feet to 225 feet, and in oil content up to 25% by weight. They cover an area estimated at from 10,000 to 50,000 square miles. A large part of the area is overlain with shale and sandstone up to a maximum depth of 1,800 feet, and underground methods of mining are not considered workable. The oil will not flow into wells fast enough to be pumped commercially. But erosion on the Athabasca River and its tributaries has left benches that can be mined by open pit methods.

The bituminous sands have produced a high quality of asphalt which has been used for paving fairly extensively in the past, and it is expected to be used for this purpose also on the Canada-Alaska Highway now being built.

They stretch for miles on each side of the river, covering roughly an area 115 miles north and south, and 55 miles east and west. The sands lie about 600 miles north of the international boundary in an area which can be developed the year-round.

The extracting plant which went into operation last year on a small scale took 11 years of research by American engineers to develop. The sands go through a separation process, then to a refinery where the crude oil is turned into gasoline, diesel fuels, fuel oils, asphalt and coke. It is thought that synthetic rubber may also be developed from these bituminous sands after they pass through the separation process.

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An estimated 80,000 machining operations go into the making of one *airplane*.

One thousand gallons of *industrial alcohol* per day are being produced from potatoes in Ireland.

PHARMACY

Ointment Base Improved

New ointments can be washed off with water. Mixture combines readily with common medicines, withstands severe changes of climate. Base has many advantages.

➤ OINTMENT BASES that can be whisked from clothes or skin with plain water have recently been developed by pharmacists. Greasy, messy ointments and salves may soon be out of your medicine cabinet.

Many formulas for the new type of ointment have been proposed, few have been very successful. The most promising to date is announced in the practical edition of the *Journal of the American Pharmaceutical Association*.

The new ointment base was developed by Dr. Emerson C. Beeler at the laboratories of the American Pharmaceutical Association. Smooth and "washable," the base consists of cetyl alcohol, white wax, propylene glycol, sodium lauryl sulfate, and water.

The alcohol used is a giant molecule, compared to your rubbing alcohol. This makes it a white, wax-like solid. In combination with the "wetting" agent, sodium lauryl sulfate, it causes medicinal agents to penetrate the skin better. It is also greaseless.

Because the medicine is transferred through the skin more readily than when old-type vaseline or wool-fat bases are used, Dr. Beeler points out that medicines can in some cases be used in lower concentration than formerly, thus conserving supplies.

It also permits the heat of an inflamed area to escape more readily; discharged fluids are not sealed in as is often the case with greasy salves.

But the cetyl alcohol and "wetting agent" would be useless without the colorless, odorless chemical — propylene glycol. This is widely used to make the creams and salves in your medicine cabinet soft and spread smoothly. It is also a good solvent for carrying such medicines as vitamin D and the sulfa drugs.

Mixed properly by the pharmacist, these ingredients can be used to carry many valuable medicines used for a variety of conditions, especially skin diseases.

Many bases of the "washable" type formerly tried, were of limited value because the medicines which they carried were chemically altered by the base.

The new base has already been used to carry many of the commonly used substances, Dr. Beeler reports, and no difficulties have been encountered.

"It is apparently compatible with every medicinal substance with which it has been tested . . ." he reports.

Neither is this easily prepared base affected by severe changes in climate, such as might be encountered in military medicine.

"It has been alternately placed in the freezing unit of the refrigerator and in an atmosphere at 50 degrees Centigrade temperature (122 degrees Fahrenheit) at a 24-hour interval for a period of two weeks," Dr. Beeler declares, "without affecting the general properties."

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TELEFACT
PICTOGRAPH CORPORATION
SCIENCE SERVICE 9.22.2
NEW NIGHT WEAPON
FOR NAZI AIRPLANE
NAZI FIGHTER PLANES NOW MOUNT SEARCHLIGHTS IN THEIR NOSES, TO HELP IN DEFENSE AGAINST BRITISH NIGHT ATTACKS.

GEOLOGY

Neutrons Used to Help Find Oil Deposits

➤ NEUTRONS, uncharged atomic particles that have figured in the search for atomic power, may now serve in the search for petroleum. A source of neutrons, consisting of a mixture of radium and beryllium, is lowered in an oil well followed by an ionization chamber which detects the radiations induced in the rocks by the neutron bombardment. The neutrons easily penetrate both metal and cement casings. The effects are amplified and carried by an electrical cable to the surface where a continuous record of them and the corresponding depths is made on a moving tape.

This is similar to electric and radioactive methods of "well-logging" already in use. But neutrons give direct evidence of the porosity of the rocks, that is, of their capability of bearing oil.

If a porous layer is discovered at a certain depth, the well owners can lower a perforating gun which will shoot holes through the casing and determine if oil is there. The new method is described by Bruno Pontecorvo, research physicist of Well Surveys, Inc., Tulsa, Okla., in *The Oil and Gas Journal*.

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RESOURCES

United Nations Will Gain 2,000,000 Board Feet Balsa

➤ TWO MILLION board feet of balsa wood, in addition to the quantity previously anticipated, will be available for warplanes and life-floats in 1943, the Office of War Information disclosed. A huge kiln for drying the precious lumber has been successfully delivered to Ecuador, where balsa timber is cut.

Kiln-drying of balsa is necessary because the wood rots unless dried immediately after harvesting, and Ecuador's long December-to-April rainy season prevents air-drying.

So vital is balsa to winning the war that a Combined Raw Materials Board, set up by the United Nations to keep war plants here and abroad supplied with materials, has requisitioned every ounce of the wood and allocated it to war factories. This United Nations agency foresaw the need of the new kiln, to take care of the growing volume of Ecuadorian balsa production. An order went out for immediate shipment and the kiln is now safely delivered to its South American destination.

Lives of thousands of merchant seamen have been saved with balsa life-floats. Tons of aluminum have been freed for bombers and fighter planes through the use of the light, tough wood in trainers and cargo planes.

Search for additional stands of balsa timber goes on in uncharted jungles from Bolivia to the West Indies. Forestry experts, sent out by the Combined Board, are ploughing through Southern Hemisphere forests looking for harvestable sources.

Only half as heavy as cork, stronger pound for pound than spruce, the wood which once made toy airplanes is saving lives at sea, now, and carrying cargoes of weapons to United Nations fighting fronts. There will be no more model planes of balsa for the duration; model-makers will use other softwoods. Balsa is vital to winning the war.

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METALLURGY

New Electrical Method Quickly Detects Gold

➤ GOLD PRESENT in alloys or in thin electroplating can be detected in about one second and the test is sure-fire according to the scientists who devised it. They are J. A. Calamari, Robert Hubata, and P. B. Roth at the New York Medical Laboratory in Brooklyn, N. Y. The test is described in *Industrial and Engineering Chemistry*.

The method is electrical. A sample is connected to the positive pole of a battery, 6 to 9 volts, and three or four layers of filter paper which have been dipped in a solution of sodium nitrate-hydrogen peroxide are laid on top. A graphite rod connected to the negative pole is touched to the filter paper.

If gold is present a purple spot appears. From the intensity of the color the percentage of gold present can be estimated. Most other metals give no reaction, but chromium gives a blue spot, vanadium a red one and silver a black spot. The test is sure-fire for gold.

Science News Letter, October 3, 1942

IN SCIEN

ORNITHOLOGY

Starlings May Carry Hoof-and-Mouth Disease

➤ STARLINGS are under suspicion as possible carriers of hoof-and-mouth disease, serious Old-World malady of cattle. Circumstances and statistics in support of this theory are offered in *Nature*, by Dr. W. S. Bullough of the University of Leeds.

Although British agricultural authorities, like the federal and state authorities in this country, have succeeded in stamping out each outbreak of hoof-and-mouth disease soon after its discovery, these outbreaks have been of rather frequent occurrence and undiscoverable origin.

It is now suggested that the virus is carried to England from the Continent, where the malady is always rife, by migrating starlings. Bird-banding has proved that starlings of the Continental strain, unlike the British variety, do migrate in winter from Scandinavian and other northwestern European lands to the British Isles. And the feeding habits of starlings bring them into close contact with cattle.

While the case against starlings has not been clinched, outbreaks correlate with most active migration.

Science News Letter, October 3, 1942

ENGINEERING

Unexploded Bombs Located at Kelly Field

➤ A STRANGE procession of three men was recently seen on Kelly Field. The man ahead wore earphones and carried a strange contraption in front of him. The two behind bore a litter on which were batteries and other electrical equipment. All three were intently looking at the ground. They were looking for unexploded bombs left buried since World War I. A demolition squad exploded the bomb.

Science News Letter, October 3, 1942

Every boy and girl in high school and every high school principal and teacher will be interested in the announcement upon the four special pages in the center of this issue. When you have finished reading these pages, lift them out and hand them to someone who will be able to arrange the formation of a science club in a local high school.

To the Educators of America:

GOAL: **To aid the Teachers of America to discover and develop scientific and technical ability in American Youth for war and peace**

GOAL: **A Science Club in every Public High School, Private or Parochial secondary school . . . A SCIENCE CLUB IN YOUR SCHOOL**

MORE THAN 30,000 boys and girls belonging to more than 1,000 science clubs, sponsored by more than 1,000 alert teachers, have engaged in scientific discussion and experiment during the past year.

This was a test year, since SCIENCE CLUBS OF AMERICA, with which these clubs are affiliated, is just starting in this movement to uncover and expand scientific knowledge and skill among boys and girls in school.

But now we are on the way—all of us together. Now we are ready to go ahead, full tilt.

This is an important part of the national effort to bring high school education to the highest point of service for war and peace. From generals and admirals, from college presidents, industrialists and men in public life, the cry has come: "Find and develop more scientific ability among our boys and girls."

We must meet the challenge. What is your share in this important movement?

(1) Organize, or cause to be organized, a science club in your school.

(2) Affiliate your proposed (or already organized) club with SCIENCE CLUBS OF AMERICA.

No fee is required for affiliation.

(3) Accept and use the assistance offered by SCIENCE CLUBS OF AMERICA.

Last year, a fee was required from every affiliated club. This year, no fee is required to *get started* and to receive the *continuing help and cooperation* of SCIENCE CLUBS OF AMERICA. SCA—dedicated to the development of science talent—is administered in the public interest by Science Service, the endowed, non-profit Institution for the Popularization of Science.

Some clubs will want to help in the growth of the movement—such clubs may voluntarily and at their discretion elect to contribute $2 to the movement and receive charter certificates and membership cards. This is entirely at their option.

On the next pages we have reproduced some of the activity notes of the past few months. They are short, but each tells a story of interesting meetings, knowledge gained, skills improved.

(OVER) ★

Members of science clubs affiliated with SCIENCE CLUBS OF AMERICA are having a good time while benefitting themselves and their country. Science clubs achieve some of the most important objectives of the new High School Victory Corps. The amazing success of the First Annual SCIENCE TALENT SEARCH and the resulting awards of Westinghouse Scholarships, proves the practical value of science club activity for boys and girls. Such activity gives a running start to a school for participation in the *Second* Annual SCIENCE TALENT SEARCH, soon to be announced.

The GOAL for the educators of America is a science club in every public high school, private or parochial secondary school—with 500,000 members in those clubs. That's a big job. But the time is not far off when a school without a science club will be like a schoolroom without books.

The IMMEDIATE GOAL is: A science club in your school, and to get it, your positive action is needed.

★ We are ready to help you.

ACTIVITY NOTES

from CLUBS affiliated with SCIENCE CLUBS OF AMERICA

Springfield, Mass. You have heard of an Aquacade and a Cavalcade, but did you ever hear of a "Technicade"? That is the name for their technical science show concocted by members of the Chemistry Club at the Technical High School. The recent "Technicade" included discussions and demonstrations of chemical warfare, incendiary bombs, explosives and projects showing the distillation of crude oil, chemistry of photography, spectroscopy and plastics. The club is sponsored by Alfred R. Lincoln, chemistry teacher.

Philadelphia, Pa. The Fact-finders, a club formed in Troup 293 Boy Scouts of America, and sponsored by Ben Maser, Director of Crafts, Hobbies and Educational Projections is interested in photography, miniature model making, chemical and electrical experiments, nature study and collections, mineralogy, miniature gardens, aquariums and astronomy. It presents programs to the Parent Association and hears lectures by visiting scientists.

San German, P. R. "Explorers of the Unknown" is the name of a new science club at the San German High School. Sponsored by J. Nagario de Martin, chemistry teacher, this group puts realism in its projects by collecting money for the purchase of needed classroom material.

Kalispell, Mont. A buying service for amateur scientists is being operated by an independent group formed here. Such a buying service is an excellent plan for any science club. It is the duty of a small group in the club not only to get information as to where to buy necessary materials but also to serve as an outlet through which surplus materials may be disposed of to others in need of the supplies. The Kalispell Amateur Chemist Society is sponsored by Waldemar Olsen, science teacher.

San Diego, Calif. Chi Eta Mu, a club formed at the Hoover High School, is hinging most of its activities upon war work and national defense. At present, members are taking first aid courses under the sponsorship of L. Sorkness, head of the science department.

Lakeville, Conn. Two or three social meetings with games, songs, and refreshments add sparkle to the activities of the Hotchkiss Chemistry-Physics Club at Hotchkiss School, Lakeville, Conn. At this school one will find photography, medical, weather bureau and railroad clubs. This club is sponsored by William N. Stakely, chemistry instructor.

Richmond, Ind. The study of Richmond fossils is being undertaken by members of the Hibberd Science Club, Hibberd School. The group is sponsored by Velma McCulloch, science teacher.

Chicago, Ill. Members of the De La Salle Biology Club at De La Salle High School are studying land erosion. Models are being built to illustrate the factors which are responsible and which can be used to control the washing away of the soil. The club is sponsored by Brother George, F.S.C.

Altoona, Pa. The Nature Observation Club at Altoona Senior High School, under the sponsorship of Harold D. Yoder, biology instructor, has planted more than a thousand trees. To encourage and practice conservation the members have classified plants and animals found in the vicinity of Altoona and have studied them in their natural habitats. Throughout the winter the group has maintained bird-feeding stations.

New York, N. Y. The Biology Squad of the DeWitt Clinton High School, under the direction of Miss Dorothy P. Tuthill, is working out advanced research problems in slide making, hydroponics, genetics experiments with fruit flies, guinea pigs, tropical fish, and the preparation of museum mounts such as stained bone and tanned skins.

Oneonta, N. Y. The Chem Squad of Oneonta Senior High School, sponsored by Mrs. Madeleine Frink Coutant, is holding monthly movie shows on scientific topics not taught in high schools. The Squad visited a science club in Walton, N. Y., and held a Science Congress.

Flint, Mich. Slides and various mechanical devices to demonstrate positions of the principal stars and constellations and to show the movement of the planets and other heavenly bodies are being made by members of the Alpha Astronomy Club at Emerson High School. Public demonstrations and night observations are carried on avidly. Members also engage in round-table discussions and participate in their own "Hobby Lobby." The club is sponsored by teachers Elizabeth Norton and Ralph Brown.

Ashtabula, Ohio. Before a candidate can be accepted for membership in the Park Science Club at Park Junior High School, the individual must submit a scientific project for approval. Projects thus submitted are used as the basis for future programs of the club. Maintaining the school's decorations, scrapbooks and exhibits are important duties of the members. The club is sponsored by Richard G. West, science teacher.

Harrisburg, Ill. Bernice Varvil, sponsor of the Advanced Science Club of the Harrisburg Junior High School, would like to exchange insect exhibits and other items with a club in some Latin American country.

Sapulpa, Okla. Members of the Sapulpa Junior Science Club at Washington School are making what they believe will become the finest collection of insects and seeds of wildflowers and weeds in that part of the country. The club is sponsored by Zella Breitenbecher, teacher.

Tulsa, Okla. The Field and Stream Club of the Woodrow Wilson Junior High School is actively interested in natural sciences with an occasional mixture of the physical sciences. Every year the club makes a Christmas bird census; participates in a school flower show. This club is sponsored by Edith R. Force, science teacher.

Longview, Texas. The Lithium Chapter of the Texas Junior Academy of Science which is at Longview Senior High School will undertake a study of the natural resources of Texas. Sponsored by Adda Reid Templeton, teacher of chemistry and physics.

Barker, N. Y. Each week a committee of the Science Research Club at Barker Central School records the relative humidity, temperature, barometric readings and wind direction and prognosticates the coming weather. This information is posted for the benefit of the student body. Priscilla Wolff, head of the science department, is sponsor of this club.

Syracuse, N. Y. Defense bonds and stamps were awarded for outstanding contributions to the program of the Syracuse Science Center. This was a Congress held for the Science Clubs in the thirteen counties served by this Center. The event was held at Syracuse University. Dr. Richard R. Armacost of Syracuse University was director.

Duke Center, Pa. The Science Club of the Otto Junior-Senior High School intersperses its work on scientific projects with a discussion of current scientific news and problems. The members of this group already have studied some taxidermy, geology, birds and trees. They have made model airplanes and studied various inventions. A recent trip to a game preserve familiarized the members with small game in its natural habitat and with the state's hunting laws. The club is sponsored by Harold Fenner, science teacher.

New York, N. Y. The Science Workshop Club formed at the High School of Music and Arts is a combination of seven workshop clubs dealing respectively with poster making, model making in balsa wood, photomicrography, biology experiments, needlework diagrams, making slides for projection, and vitamin studies and rat breeding. The club is sponsored by Dorothy M. Muller, teacher in advanced biology.

Detroit, Mich. The Mineral Club formed at Eastern High School is surprisingly familiar with strategic materials. The reason is that this group has set up an exhibit of things important to our country's National Defense and is now also working upon conservation displays. The club is sponsored by Willard C. Moore, instructor in geography and geology.

New Cumberland, Pa. A model of an atom smasher will be completed this year by members of the Science Club of New Cumberland High School. This active group operates the school's public address system and visual education program. Plans are now being laid for operating a weather bureau for the school. Some of the members are building radio transmitting and receiving sets while others are developing and printing their own pictures. Two of the members are carrying on experiments in color photography. The club is sponsored by John R. Smeltz, chemistry and physics teacher.

Marinette, Wis. The Nucleus, a Biology Club at the local High School, in its lighter moments, sponsors a school dance, candy sale and a terrapin derby (turtle race to you). Considerable experimental work is being done with soilless gardens and earthworm culture. The plants and aquaria in the classroom are attended; and insects are mounted and preserved. Club members also study fresh water biology and take numerous field trips for experimental material. This group is sponsored by E. Gertrude Wagner, biology teacher.

Baltimore, Md. Glass blowing and experimental work with liquid air are two of a number of projects which at present are interesting members of the Edgecomb Science Club, sponsored by Mrs. J. R. A. Davis, instructor in biology.

Gardiner, Mass. National recognition and local acclaim has come to members of the Natural Science Club of Gardiner High School for establishing and maintaining a Nature Trail on 47 acres of city land made available to the club by local authorities. With little or no preliminary training the club set out the trail, posted 60 identifying markers, cleared underbrush, planted 450 four-year-old trees, deepened and dammed a small swamp and disposed of brush piles. The club, sponsored by Helen Whittier, biology teacher, had the wholehearted support of Omer H. La-Roche, municipal tree warden.

Staunton, Va. Amazing as it may sound the Science Club of the Virginia School for the Blind is studying photography this year. The sponsor of the club is Robert E. Bruce, teacher of science and mathematics.

Sikeston, Mo. During the past year members of the Sikeston Science Society of Sikeston High School, constructed three group projects of which they are justly proud. The first is a stroboscope which can be used to make rapidly rotating objects appear to stand still or move backward. The others are a radio receiver and a portable receiver. The sponsor is Paul H. Roberts, head of science department.

Raleigh, N. C. National Defense and conservation play an important role in the programs of many science clubs. The W.H.S. Science Club formed at Washington High School, is carrying on laboratory projects to demonstrate the making of the more common household products such as baking powder, soaps, inks, and pure food dyes; while others are conducting nutrition experiments. The club is sponsored by Mrs. Fanny V. Latham, teacher.

Brasher Falls, N. Y. Men of science from distant towns frequently lecture to members of the Luminar Science Club established at Brasher and Stockholm High School. This club has had a very successful "Penny Bazaar." The funds provided by the "Bazaar" were used to purchase materials and equipment. Members also hold a Science Fair at which projects and exhibits are displayed. The group is sponsored by Winom Mahoney, science instructor.

Pittsburgh, Pa. Everything directly or remotely connected with microscopic work and techniques is of interest to members of the 'Scope Club at Taylor Allderdice High School. Making slides, mounting specimens, micro-projection and photo-micrography are a few of the interests. The members also mounted insects in plastics which were exhibited at the Science Fair at Pittsburgh. This group is under sponsorship of Mae Weber Smith, biology teacher.

Austin, Texas. During the past year members of the Raymond L. Ditmar's Scientific Society at Austin High School initiated a tuberculin testing campaign for the school. The sponsor is S. W. Hayes.

Princeton, N. J. One of the members of the Science and Engineering Club at Princeton High School has almost completed a high-temperature arc furnace with which he and other members will carry on extensive investigations. Such a furnace gives enough heat to melt or volatilize nearly every known metal. The use of the school laboratories and facilities for any phase of investigation in any branch of science or engineering is granted to every member of the club which is sponsored by A. Lewis, head of the chemistry department.

More than one thousand science clubs are active in schools—soon there will be many, many more.

Services Supplied to Affiliated Clubs WITHOUT COST

SCIENCE CLUBS OF AMERICA is administered by SCIENCE SERVICE in the public interest

ASSISTANCE OUTLINES—to help you get started, and to help stimulate club activities, sponsors receive:

How to Organize and Activate Your Science Club
War Services for Science Clubs

SCA SPONSOR GUIDE—A *news bulletin* to sponsors, telling what clubs and science centers are doing, with notes on new methods. Sent to sponsors at intervals during the school year.

CLUB PROGRAM MATERIAL—The *Bulletin of Services,* sent to each sponsor, describes material that may be obtained free or at low cost from industrial, educational, governmental, philanthropic sources. Makes it easy to select and obtain just those materials most useful to the group in the club. A committee of students can take this *Bulletin of Services* and work out a tentative program of meetings to submit to the sponsor for approval.

POSTERS FOR MEMBERS—What are other clubs doing? Every club member is interested in that. It brings the spirit of rivalry to the work of the club. For this reason *poster-pages* are provided from time to time, containing news of activities in clubs all over the Nation. These can be passed around among the members or placed on a club bulletin board.

SCHOLARSHIP OPPORTUNITIES—Sponsor and members will be kept informed of the nationwide *Science Talent Search* for the Westinghouse Science Scholarships, as well as other higher education scholarship possibilities of which members may avail themselves.

(OVER) ★

(Services supplied to science clubs WITHOUT COST—*continued from preceding page*)

YOUTH LOOKS AT SCIENCE AND WAR—A *book* will be sent to every sponsor, containing the questions and answers of the first Science Talent Search, the essays of the 40 boys and girls who won the trips to Washington, and the names of the 260 who received Honorable Mention. This book contains subject matter for many meetings. It will be an inspiration and a definite help to club members entering the next annual Science Talent Search.

BOOKLIST FOR SCIENCE CLUBS—A compilation of titles, classified by science subjects, useful as a check list and research source for members.

Supplied to Clubs AT THEIR OPTION

CHARTER, MEMBERSHIP CARDS—Voluntarily, and at each club's discretion, $2 may be contributed to Science Clubs of America to be used in promoting the formation of science clubs in all schools, such $2 contribution to bring the club its CLUB CHARTER CERTIFICATE for 1943, and an official SCA MEMBERSHIP CARD for *each member* of the club.

INSIGNIA—Beautifully embroidered felt emblems, with SCA insignia in red, white and blue, suitable for sweater, dress, coat or armband use, 35c each. They are equally popular with boys and girls. (A limited quantity of sterling silver pins with safety catches and some pendants, both suitable for club awards, 50c each.)

PRIVILEGE CARD—Every affiliated club receives a Privilege Card which provides a 40% saving on a one year subscription to SCIENCE NEWS LETTER, the weekly summary of science. This magazine brings its readers of all ages the new developments in 88 science subject classifications. Special rate to affiliated science clubs, $3.00 per year (the regular subscription rate is $5.00 per year).

THINGS of science—Twelve times a year, practical exhibits, experimental material, instructional information in kit form handy for club examination and testing are sent to purchasers of this unusual service. Sponsors all over the country have found "THINGS of science" a useful supplement to science club programs. One year, $4.00.

BOOK SERVICE—Science Clubs of America will obtain for sponsors or affiliated clubs any book of a scientific nature that is published in the United States, and send it to the sponsor postage free on receipt of check or money order for the price of the book. Lists of the latest books on science subjects are published weekly in SCIENCE NEWS LETTER, for the convenience of sponsors and clubs.

SCIENCE CLUBS OF AMERICA

APPLICATION

Open to Clubs to be Organized as well as to Clubs now Active

To SCIENCE CLUBS OF AMERICA, 1719 N Street, N.W., Washington, D. C.

Please enter us for affiliation with SCIENCE CLUBS OF AMERICA. It is understood that you will promptly send to me as sponsor or leader, **free**, "How to Organize and Activate Your Science Club," "War Services of Science Clubs," "Youth Looks at Science and War," "Bulletin of Services," and "The Science Club Booklist." We are to receive, **free**, the SCA Sponsor Guide, Posters, Science Talent Search announcements, and all SCA information mailed to affiliated science clubs including news of activities of other science groups throughout the Nation, and in other ways to have the cooperation of the SCA staff in helping our Club conduct interesting and worthwhile activities.

Voluntarily and at our discretion, our Club may elect to contribute $2 to be used in promoting the formation of science clubs in all schools—such $2 contribution to bring us our CLUB CHARTER CERTIFICATE for 1943, and an official SCA MEMBERSHIP CARD for *each member* of our Club.

PLEASE PRINT

Name of Sponsor _____ Position

School or Organization _____

Street Address _____

City _____ *State* _____

You are cordially invited to send in this APPLICATION for the affiliation of a club in your school—whether the club is to be organized later or is now active.

E FIELDS

PHYSICS—PSYCHOLOGY

Fluorescent Paint Is Best In the Darkest Blackouts

➤ OUTDOOR fluorescent markings may be useful on very black nights but at other times their usefulness is doubtful. So writes Dr. C. E. Barnett of the Research Division of the New Jersey Zinc Company in *Chemical and Engineering News*. By starlight, with the moon absent, a good quality of luminous paint may be usefully visible four hours after sundown. But at other times markings of white paint will be equally if not more efficacious, he writes. The claims of many manufacturers that their paint will glow for 48 hours after excitation are true enough, he says, but the feeble bluish-green light can only be seen by the dark adapted eye. And this adaptation is disturbed by any light greater than starlight.

Science News Letter, October 3, 1942

BACTERIOLOGY

Bacteria Found to Blame For Corrosion of Pipes

➤ BACTERIA HAVE been found responsible for corrosion of iron pipes carrying deep well waters in the Miami Valley, Ohio. These waters contained very little oxygen and practically no other corrosive substances that could be detected by the usual chemical test. Similar trouble with "red water" has been cleared up with chlorine treatment which killed the bacteria.

The investigation which lead to this discovery was carried out by Dr. Arba H. Thomas, chief research chemist of the American Rolling Mill Co., of Middletown, Ohio.

The organism chiefly responsible, Dr. Thomas found, was *Coccobacillus,* an organism of the anaerobic type. This type requires no oxygen for its life processes. In fact oxygen is poison to it. This type reduces sulphates in the water and liberates hydrogen sulphide which attacks the iron producing the black iron sulphide.

This kind of corrosion is therefore very different from that produced by electro-chemical action which results in the red oxide of iron or rust.

Other organisms, the so-called "iron-consuming" bacteria, were also found. These, *Crenothrix, Spirophyllum* and *Leptothrix,* do not actually devour metallic iron, Dr. Thomas said, but they do consume dissolved ferrous salts, converting them to the insoluble red ferric hyroxide or a similar substance, producing "red water."

By introducing oxygen into the water, it was found that the rate of corrosion decreased as the quantity of oxygen increased, just the opposite to what would have occurred if oxygen had been the cause.

These bacteria, Dr. Thomas said, have long been known to biologists, but their connection with corrosion was only recently suspected. They are not disease producing.

The remedy is to chlorinate the water, or where it is to be used for drinking purposes and the chlorine taste would be objectionable, the chlorine-ammonia or chloramine treatment can be used.

Science News Letter, October 3, 1942

MEDICINE

Flu Vaccine Promising For Epidemic Control

➤ HOPE of controlling, at least to some extent, future influenza epidemics that may add to the horrors of war appears in a report by Dr. Joseph Stokes, Jr., and Dr. Werner Henle, of the University of Pennsylvania Medical School (*Journal, American Medical Association,* Sept. 5.).

A vaccine, they report, protected 43 out of 44 boys who were directly exposed to influenza.

Of 28 unvaccinated boys who breathed this same influenza germ-laden vapor, 10 had attacks of influenza.

The vaccine that gave such striking protection might not be able to stop an epidemic of influenza, even if it were possible to vaccinate the entire population. The vaccine protects against influenza "A" but there are other types of influenza that occur in epidemics against which the vaccine could not give protection.

Science News Letter, October 3, 1942

ENGINEERING

Glass Yarn Is Spun For Bomber's Electric Wiring

See Front Cover

➤ DESPITE the old adage that those in glass houses should not throw stones, the big bombers that throw block busters use glass as an important part of their construction.

The photograph on the front cover of this week's SCIENCE NEWS LETTER shows some of the millions of miles of glass filament which are drawn from the forming tubes and twisted into yarn that later will be braided over flameproof electric wire for use in bombers. Each strand coming from each tube contains over 200 tiny glass filaments.

The illustration is an official photograph of the Office of War Information.

Science News Letter, October 3, 1942

MEDICINE

AMA Cancels Next Year's Annual Convention

➤ THE AMERICAN Medical Association convention scheduled for San Francisco in 1943 has been cancelled, it is announced in the Association's *Journal.* Reasons for this action are the tremendous demands on the medical profession made by the war and the strain on the nation's transportation facilities that would be imposed by this meeting of 6,000 to 10,000 doctors plus more thousands from related professions, most of whom would have to travel long distances to the scheduled convention city.

This is the third time in the 93-year history of the association that its annual session has been cancelled. The first was in 1861 when the session was postponed for a year because of the outbreak of the war between the states and the second in 1862 when the session was again postponed for a year because of the demands that war was making on the medical profession.

The association's house of delegates, board of trustees, scientific councils and officials will meet in Chicago in June, 1943, "to consider the many significant problems of the medical profession occasioned by the war, particularly such as concern the provision and distribution of physicians and the provision of medical service."

Science News Letter, October 3, 1942

Every boy and girl in high school and every high school principal and teacher will be interested in the announcement upon the four special pages in the center of this issue. When you have finished reading these pages, lift them out and hand them to someone who will be able to arrange the formation of a science club in a local high school.

NUTRITION

Victory Meals

Protein foods enable the housewife to provide her family with nutritious substitute main dishes for the meatless days that are ahead.

By JANE STAFFORD

➤ WHAT ARE we going to eat for meat today? Cheese fondue or peanut butter soup? Baked beans or pecan and rice loaf?

Meatless days or meat rationing has put the question on the tongues of hundreds of thousands of American civilians. The answer depends on the ingenuity of housewives and cooks and on their knowledge of foods and their nourishing properties.

First thing to consider in the search for meat substitutes is the place meat fills in our daily diet. During the past decade, U. S. Bureau of Home Economics experts report, our per capita consumption of meat has ranged from 125 to 160 pounds per year. That is between two and three pounds per week per capita. The proposed two and one-half pounds per week per person ration therefore seems, offhand, to be just about the amount we have always been eating.

Actually, however, the amount of meat each of us eats depends considerably on the size of our food budget. Many have not been able to afford two and one-half pounds per week per person, while others have customarily eaten much more. If you have a record of how many pounds of meat you bought in an average week and divide it by the number of persons in your household, you will know whether the proposed meat ration is more or less, and just how much less, than you ordinarily eat.

One Serving Enough

Regardless of how much meat you like and are accustomed to eating, you rightly want to know how much meat you need to keep well and strong. One serving of lean meat, fish or poultry daily is called for by the national nutrition yardstick drawn up by leading scientists just before the war, when we were trying to build America strong for defense. The size of the serving is not specified, but the yardstick does give the exact amounts of the chief nourishment items in meat, protein, iron, thiamin, and niacin, which everyone should get.

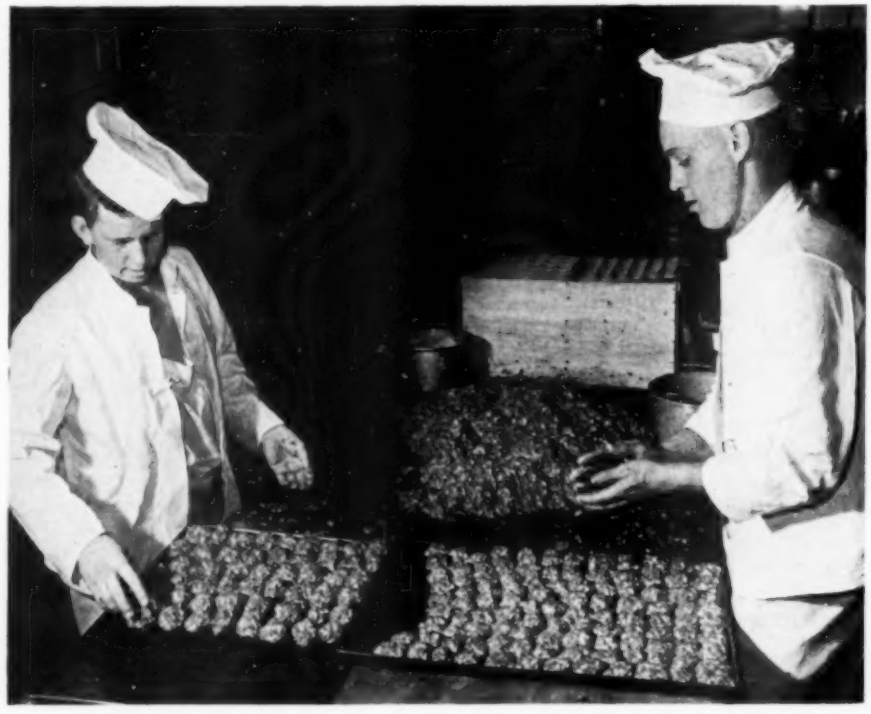
You ordinarily get some of each of these four from other foods. Your problem on meatless days is, therefore, to make sure your meat substitute supplies each of the four nourishment items in which meat makes an outstanding contribution.

Those who can afford it or who can raise their own, can eat chicken or other poultry on meatless days and thus solve the problem quite simply because poultry is in the same nutritional class as meat. Fish is also, but the fish supply is likely to be limited as long as submarines threaten the fishing fleets.

Eggs, cheese and milk, cereals, peas and beans and nuts are other food sources of protein. The first three furnish what scientists term "high class" or "complete" protein.

Protein is the essential stuff of which all living tissue is made, from brain, heart and other internal organs to muscles, blood, skin, hair and nails. There are many kinds of protein, each made of simpler materials called amino acids, or protein building blocks. These amino acids are formed when the proteins of food are digested and it is the amino acids from our food that are actually used to build body tissues. The body can build some amino acids from simpler chemicals but some it must get ready-made from foods. These particular ones have been labeled "essential" amino acids. Foods that furnish all the amino acids, including the 10 essential ones, are called complete protein food sources. These are the foods of animal origin, meat, fish, poultry, milk, cheese and eggs.

Cereals, nuts and vegetables of the legume family such as peas and beans furnish proteins, but their proteins are incomplete in that they do not furnish all 10 of the essential amino acids. Exceptions to this are soybeans and peanuts. Peanuts and heated soybeans con-



IN THE ARMY NOW—Army cooks shown in this official photograph from the U. S. Department of Agriculture, have priorities on huge quantities of meat to keep the men in top fighting trim.

***NO MEAT** occasionally need not prove a hardship. Eating the right substitutes will keep youngsters healthy and strong.*

tain protein much superior to the ordinary vegetable or plant protein, nearly matching the efficient proteins in meat, milk, eggs and cheese.

Soybeans are known to Americans chiefly as soybean sauce for chop suey, though our Chinese allies for centuries have used them for food as well as condiment. In recent years, soybean cultivation in America has increased greatly and in some communities canned soybeans and soybean flour are now available. Unfortunately, however, this food, which would go a long way to solve the problem of a nourishing meat substitute, is not yet generally available.

So, to get first-class protein in a meat substitute, we must depend chiefly on eggs, cheese and milk. Those who do not like to drink milk can take it in many other forms. Breakfast cereal, for example, can be cooked in milk instead of water. Milk can also be disguised in custards, puddings, soups and chowders.

Milk Furnishes Half

A pint of milk furnishes about half the day's protein needed by anyone except nursing mothers. Grown-ups should take one pint of milk daily according to the nutrition yardstick, so if they can double their milk intake on meatless days they need not worry about losing out on protein. Don't let the cost worry you, either. Few foods supply efficient proteins at so low a cost as milk, and as far as protein is concerned, skim milk is as valuable as whole milk.

Protein, however, is not the only nourishing item to search for in meat substitutes. Most people know that meat supplies iron, needed for building hemoglobin, the chemical that gives the red color to our blood. More important than its color is the transport job hemoglobin does in carrying vitally needed oxygen to every cell in the body.

Need More Iron

So we must have iron to build plenty of hemoglobin. In 1940, Bureau of Home Economics figures show, nearly a fourth of the total iron in American family diets came from lean meat, fish and poultry. But cereals in the past few years have contributed about as much iron to American diets as have meats. One of the easiest ways to add iron to the diet is to eat more whole grain cereals and breads. Enriched flour, it should be remembered, has more iron than fine patent flour but not as much as whole-wheat flour.

Vegetables, particularly potatoes and the dark green leafy ones, also are good sources of iron. So are mature peas and beans, eggs, dried fruit and molasses.

When it comes to finding meat substitutes that supply the vitamins of meat, we must turn again to the whole grain cereals, dry beans, peas, peanuts and soybeans, if you can get them.

The meat vitamins are thiamin, popularly known as the morale vitamin or B_1 and niacin, the pellagra-preventing and curing vitamin formerly called nicotinic acid. The thiamin and niacin present in wheat is largely lost in the milling process. If we ate half our cereals and flours as whole wheat, we would get four times as much niacin and two or three times as much thiamin. Eating enriched flours and cereals increases the thiamin and niacin content of diets, but not to the same extent as whole grain products.

If you want recipes for meat substitutes, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington, D. C., for bulletin on meat substitutes.*

Science News Letter, October 3, 1942

INVENTION

Government Tells What You Should Not Invent

➤ UNCLE SAM can tell you one invention that you don't need to try to invent. It is the idea of how to help win the war most often suggested to the National Inventors Council.

This popular device is a net or screen to protect ships against torpedoes.

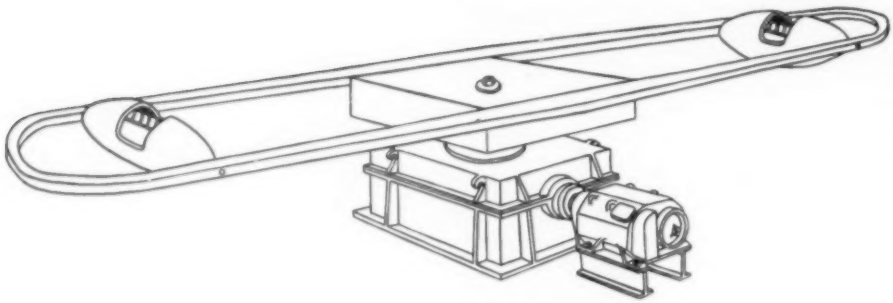
The National Inventors Council, in announcing that 100,000 ideas have been submitted to it by our nation of inventors, explained that several thousand of these were devices for protecting ships against torpedoes.

Because this field of invention has had such intensive consideration, it is suggested that inventors would be wise to direct their efforts to a less developed category of inventions.

During the last World War, the Naval Consulting Board received 6,740 similar suggestions. Of their defensive value, this Board said:

"Up to the present time not one of these proposals involving screens of any kind has received the approval of the Navy Department or of the merchant marine. The principal objections offered to these devices are that they are heavy, difficult to hold in position, unmanageable in a heavy sea, and that they interfere with the speed and with the ability of the vessel to maneuver—the immunity of a vessel to submarine attack is dependent very largely on its speed and also its maneuvering ability."

Science News Letter, October 3, 1942



HUMAN CENTRIFUGE MACHINE—With which flight surgeons in an eastern laboratory will reproduce the acceleration conditions corresponding to all the known or desired flight maneuvers. With such test it will be possible to make certain that the speed and maneuverability of a new plane will not exceed a pilot's physical limitations. The boom will turn as rapidly as 54 revolutions a minute, and will be able to reach this speed in only five seconds from a standstill. It will decelerate in the same length of time, thus simulating even more than the severest operating conditions now encountered in a plane. Normal tests will average from 15 to 20 seconds running time, with lower values of acceleration, since a pilot would black out before reaching 54 r.p.m. in such a short space of time as five seconds. To simulate the effects of any particular air maneuver, a flight surgeon can mark a pattern of speed changes on a chart in a heavy, wavy line. A General Electric control device then transmits the speed changes to the driving motor. Electric drive for the centrifuge machine is made by General Electric.

AGRICULTURE

Crop Control for Sugar

Scientific system developed in Hawaii makes it possible to obtain 100% of theoretical yield. Index to fertilizer program in way plant absorbs energy available.

➤ HERE'S GOOD NEWS for those people who are concerned about the sugar shortage. Scientific control has been developed by Dr. Harry Clements of the Hawaii Agriculture Experiment Station, whereby plantings of sugar cane in any location may be consistently made to yield 100% of the theoretical.

In the beginning of the study a field experiment was set up to show the relative importance of soil and climate. This experiment was unique since the type of climate in the two fields differed radically although they were only a few miles apart. The temperature of the areas was the same but one had a low rainfall and high sunlight intensity, while the other was a cloudy region with moderate rainfall. To make sure that the soil for the crops was identical, dirt from one was transported to the other. When cane was grown in the two soils under the same climate conditions, the yield was the same. Yet, when cane was grown in these two soils in their respective climates the one yielded 134 tons per acre of good quality cane while the other gave only 65 tons of medium quality.

"All attempts to correlate the differences in growth," says Dr. Clements, "with soil, nitrogen, phosphorus, and calcium levels in the plant were without success, but an almost perfect correlation (.999) was obtained when the physical factors of leaf area, crop density, and sunlight were considered."

Thus it was evident that yield and quality are dependent, largely, on the atmospheric energy absorbed by the plant.

Since the amount of atmospheric energy varies from season to season and from year to year, it is clear that the growth and quality of the plants will also vary. It follows, then, that the index to the fertilizer program lies in the plant as it integrates the influences of the atmosphere.

A system of indices has been established for sugar cane which makes possible the continual adjustment of practices to requirements.

The primary index, the sugar content of the sheaths of certain young leaves, reflects the balance existing between the metabolism of the plant and energy available. When this index is normal (about 10% sugar, dry weight) the plant is growing at the desired rate for the particular climate. If the index rises, the plant is building carbohydrates at a faster rate than it is using them, that is, it could be growing faster than it is. If the index falls below normal, the plant is growing faster than it should and hence quality suffers.

Whatever the primary index reveals is the key to program adjustments. If the index is abnormal, secondary indices for moisture, nitrogen, etc., are consulted for the cause, and correction in irrigation or fertilizer applications are made accordingly while the crop is still in the fields.

Using this program, much of the guess work in crop management is eliminated. Economically the program pays for itself many times over in savings of fertilizers and water, not to mention the high yields of good quality crops.

Science News Letter, October 3, 1942

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● RADIO

Saturday, October 10, 1:30 p.m. EWT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Ralph I. Lloyd, president of the American Academy of Ophthalmology and Otolaryngology, will tell of some important eye diseases, and describe interesting results being obtained in their treatment.

Tuesday, October 6, 7:30 p.m., EWT

Science Clubs of America programs over WRUL, Boston, on 6.04, 9.70 and 11.73 megacycles.

One in a series of regular periods over this short wave station to serve science clubs, particularly in the high schools, throughout the Americas. Have your science group listen in at this time.

Monday, October 5, 9:15 a.m., EWT

Science at Work, School of the Air of the Americas over the Columbia Broadcasting System, presented in cooperation with the National Education Association, Science Service, and Science Clubs of America.

"What is Science" is the opening program of this series.

NUTRITION

Emergency Rations Liked

Tightly-packaged condensed chow keeps troops in top condition. Originally intended for paratroops, "K" is now used by Army as emergency meals during battle.

➤ THE NEW, tightly-packaged condensed emergency rations keeps troops in top condition. Although originally intended for paratroops, "K" ration is now also used by other branches of the Army when other food is not available.

Aviators too, are eager for the reportedly toothsome rations munched by paratroopers during four days of grueling maneuvers over Fort Benning, Ga., terrain.

The ration, especially designed for paratroopers, is known as "K" ration, and enables paratroopers to live for several days though operating in enemy territory, and far from their field kitchens.

The Fort Benning tests are the final O.K., and prove the "K" ration superior to other types of Army mess already in use. Six platoons took part in the tests, and of these 60 men were selected to eat "K" ration, the others serving as "controls" by eating the competing regular rations.

These tests are the first large-scale estimates of "K" ration, and Army quartermasters are enthusiastic.

During the tests of the ration, the men carried full combat equipment, marched from 10 to 15 miles per day; completed one 32-mile day and night march and conducted themselves as though under actual battle conditions. Each platoon was given a different ration, and none ate any food except that issued.

The men were weighed before and after the tests, and those who ate the "K" ration were given physical check-ups including a blood test to determine sugar tolerance.

According to nutrition scientists who checked results, the "K" ration proved "a superior emergency field ration which can be subjected to all types of field conditions and all sorts of weather and yet please the soldier. . . . The platoon which subsisted though the four-day experiment on 'K' rations did not show any impairment in physical or mental condition; in fact, many of them were in much better spirits and temper.

"The sugar tolerance tests carried out immediately after the field tests indicated that, if anything, the men on 'K' ration . . . were in a more satisfactory state than the men who subsisted on the other types of rations, including the regular garrison ration."

U. S. field ration "K" is packed in three separate boxes, one for each of three meals. The three vermin-and-moisture-proof, paper-board boxes weigh only 32 ounces and total 3,726 calories. Each meal contains necessary proteins, carbohydrates, fats and vitamins. Each package is clearly identified, but the soldier may select the breakfast meal for his dinner, or the supper package for his breakfast. The packages are weather-resistant, and impervious to poison gas.

Three sample meals are:

Breakfast: 1 package defense biscuit; 1 package compressed graham biscuit; 1 can veal luncheon meat; 1 package malted milk dextrose tablets; 2 packages soluble coffee; 3 tablets of sugar; 1 stick of chewing gum.

Dinner: 1 package defense biscuit; 1 package compressed graham biscuit; 1 can pork luncheon meat; 1 package dextrose tablets; 1 tube concentrated bouillon; 1 stick chewing gum.

Supper: 1 package defense biscuit; 1 package compressed graham biscuit; 1 can cervelat sausage; 1 two-ounce bar of ration "D"; 3 tablets of sugar; 1 package of lemon juice powder; 1 stick chewing gum.

An important discovery of the tests was that men who got the "K" ration required practically the same amount of drinking water as men on more liquid rations. This apparently refutes the belief that condensed foods increase the amount of drinking water needed. The chewing gum reduced the water consumption, and also helped the men to do without smoking as required by these maneuvers.

Technical experts assisting with the tests were Dr. Ancel Keys, special consultant to the Secretary of War on Foods and his two associates, Dr. Olof Mickelson, biochemist; Dr. Austin Henschel, physiologist, all from the University of Minnesota; and officers from the Infantry Board, Quartermaster Corps, and Surgeon General's Office.

Science News Letter, October 3, 1942

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Both of these books are self-teaching

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MEDICINE

New Life-Saving Bandage

➤ A NEW life-saving bandage for use by first aiders rescuing air raid victims has been developed by two English doctors, Dr. David H. Patey and Dr. J. Douglas Robertson, of Middlesex Hospital. Details of how to apply the bandage appear in the latest issue of the *British Medical Journal* received in the United States (Aug. 22).

The patients on whom the bandage is to be used are those who have had arms or legs pinned down by a beam or other heavy objects for hours before release. These patients may look surprisingly well when first dug out of the debris but some hours later become gravely ill from shock, develop symptoms of kidney failure and often die.

The condition has been labelled "crush syndrome," but the English doctors think compression syndrome more accurately describes the condition. The leg or arm that has been pinned down becomes very hard and swollen with dropsy soon after its release and is partly or completely paralyzed from nerve compression.

The condition can be remedied and the patient's life saved, Drs. Patey and Robertson believe, if the first aid team applies an elastic web bandage immediately after the beam or other heavy object has been removed. The object of the bandaging is to prevent development of the dropsical swelling and get rid of any fluid that has already accumulated.

Two patients were successfully treated on this principle by application of pressure to the limb by a blood pressure cuff and a pavaex motor. This treatment was given in the hospital, but the doctors think the treatment should be started at the scene of the accident and since the number of pavaex motors is limited, they worked out the idea of a suitable bandage to apply the life-saving pressure.

Mere advice "to apply a firm bandage" is not enough and adhesive, rubber, domette and crepe bandages are unsuitable, the doctors state. When the elastic web bandage is applied from below up, stretching it to double its unstretched length, it produces exactly the right degree of pressure. To help the first aider judge the degree of stretch as he applies the bandage, it is marked off in one-half inch lengths. Stretching each of these to one inch, a distance easily judged accurately by most people, gives the right degree of pressure.

Science News Letter, October 3, 1942

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GENERAL SCIENCE

NATURE RAMBLINGS
by Frank Thone

Publication Delayed

➤ IF YOU have a printing job to be done and think the printer is a bit slow, don't grab the telephone right away and start squawking. Think of Brother Antonio. In 1628 he turned in a big book manuscript—and the publication job has only now been completed.

The great encyclopedic work on the wonders of the New World, written by Fray Antonio Vásquez de Espinosa, long reckoned as one of the most famous of "lost books," has finally been published here by the Smithsonian Institution as vol. 102 of its Miscellaneous Collections. It was lost for a long time—lost where it is hardest of all to find any particular book because it is surrounded by thousands of other books: lost in a great library. In this particular case it was the Vatican Library, where an American scholar, Dr. Charles Upson Clark, finally discovered the manuscript and the partially printed sections. It is at last available, in English translation, for anthropologists, historians, geographers and scholars of all angles of interest, under the title, *Compendium and Description of the West Indies*.

Fray Antonio, a very energetic, inquiring sort of person, spent the greater part of his adult life in South and Central America. He recorded everything he saw, quizzed missionaries, soldiers, officials, traders, and made judicious notes of all he learned. At last growing old, he went back home to write up and publish his tremendous accumulation of information. Unfortunately he died before much of his work got into print, and for three centuries scholars have known of his writings mainly through quotations by his contemporaries.

Fray Antonio made some mistakes

in his accounts, especially where he was depending on the testimony of others. Like everyone else of his time, he describes California (which means Lower California) as an island. He also speculates on the location of the fabulous El Dorado, which has never achieved actual location on a map.

The book gives a rather good description of the American buffalo or bison as "woolly, humpbacked cattle with two short horns twisted backward. . . They are very ugly and wild. The wool on their chests in front is long and curly. They make excellent rugs from their hides."

He also had a good word to say for the Indians of what is now the southwestern United States, speaking of them as "very intelligent and well-governed. They wear cotton clothing and antelope skins which are well decorated. As jewelry they wear turquoises."

Science News Letter, October 3, 1942

RESOURCES

Over-Zealous Scrap Drive Endangers British Relics

➤ ENTHUSIASTIC but ill-informed salvagers are endangering some of Britain's prized and irreplaceable relics of former times, and have already done away with an ancient slide lathe of the year 1820 because it was in the way.

This is the complaint of E. Lancaster Burne, president, and H. W. Dickinson, secretary of the Newcomen Society (*Nature*, Aug. 8).

They go on to say that the scrapping of an ancient iron works, particularly of two unique eighteenth-century tilt hammers, was averted only by prompt action.

The Smithsonian Institution in Washington has scrapped its large collection of guns and tanks of World War I, but it has not disposed of the Wright Airplane nor any of the machinery in its museum. Scientists hope that while the maximum of scrap is produced for the war effort, care will be taken to carefully preserve all objects of enduring scientific and engineering interest.

Science News Letter, October 3, 1942

Italian experimenters are attempting to obtain *iron* from the coastal sands of that country.

Wrapping machines which once put transparent covers on cigars now wrap small radio batteries, needed for the Army, with a vital *protective covering*.

• New Machines and Gadgets •

⚙ *A PUMP for extinguishing incendiary bomb fires, which has recently appeared, operates in a novel fashion. The upright handle is swung to and fro as the operator stands on the base of the pump. This is said to be less back-breaking than the up and down motion of other pumps. The new pump is made entirely of wood and fabric. Thus no critical materials are involved.*

Science News Letter, October 3, 1942

⚙ *SHINY BRASS buttons for soldiers and bellboys may be made by treating the articles with ferric sulfate just before the final burnishing. This substance, it is claimed, removes the scale and stain produced by the stamping and annealing operations. It is recommended also for cartridge cases which must be smooth.*

Science News Letter, October 3, 1942

⚙ *BOILER SCALE can be removed, it is claimed, with hydrochloric acid to which an "inhibitor" has been added. The inhibitor prevents the acid from attacking the metal without reducing its action on the scale. Boiler scale, being a poor conductor of heat, lowers the efficiency of the boiler so that more fuel is required to raise steam. It is the same stuff that forms on a long used kettle.*

Science News Letter, October 3, 1942

⚙ *DISPOSABLE TISSUES for industry are a new wrinkle. New wrinkle is right, for they are strongly creped and extra tough for removing dirt, oil and grease from machinery, a job usually done with cotton waste and old rags.*

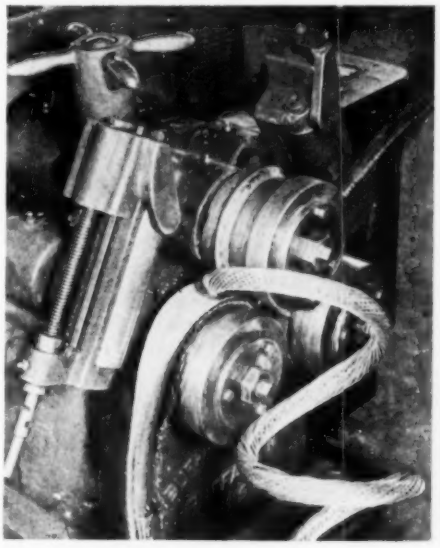
Science News Letter, October 3, 1942

⚙ *RADIO PROGRAMS you want to hear for a whole afternoon's or evening's entertainment will automatically be tuned in and out and the radio turned on and off at the proper times by a recently patented device.*

Science News Letter, October 3, 1942

⚙ *RUBBER INSULATION is saved from old cables by the machine shown in the illustration. This machine originally served an entirely different purpose, that of bending rods and pipes. It was adapted to its present purpose by a change in the rollers. The top roller carries a circular V-shaped cutter which slits and spreads the insulation so that it is peeled off and the wire is thrust off to one side. Previously the insulation was burned and only the copper was saved. Now, with a shortage of scrap rubber, both are saved.*

Science News Letter, October 3, 1942



⚙ *DRY ICE operates a newly invented target rifle in place of gunpowder. Since the ice evaporates completely to the inert gas carbon dioxide, there is no fouling of the gun, and enough crushed dry ice can be carried in the magazine of the 22 caliber rifle for 2,000 shots.*

Science News Letter, October 3, 1942

⚙ *FLICKERING FLUORESCENT lamps will no longer be the annoyance they have been if the lamp is provided with a new type of starter now available which cuts the flickering lamp out of the circuit. At that moment a red button on top of the starter snaps forward, and must be pushed back to reset the starter after the worn-out lamp has been removed from the fixture.*

Science News Letter, October 3, 1942

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington, D. C., and ask for Gadget Bulletin No. 124.*

★ **PROTECTION AGAINST GAS**

A 35 MM FILMSLIDE for science Teachers, Doctors and Defense Groups who have been assigned the difficult task of educating the public regarding the practical aspects of Chemical Warfare. The work consists of 80 frames entirely self explanatory. The first 40 are especially for the layman and are intended to clarify some of the popular misconceptions of gas warfare. This is followed by 16 charts of the more common war gases, their properties, effects and first aid measures. The last part deals with gas mask drill, protective clothing and gas shelter.

35 mm Single Frame size, $3.00. Double Frame size, mounted in 2" x 2" glass slides (including indexed carrying case) $25.00.

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TEC-W-832

First Glances at New Books

➤ THIRD AND last of a series by the same authors on fluorescent light and chemicals, ULTRA-VIOLET LIGHT AND ITS APPLICATIONS, by H. C. Dake and Jack DeMent (*Chemical Pub. Co.*, $3.25). The first two considered theoretical aspects, this one takes up practical applications.

Science News Letter, October 3, 1942

➤ PART OF a series of Aeroscience Manuals covering all the sciences underlying aeronautics are the three books: MECHANICAL PHYSICS, by Herbert Dingle, $2.25; MODERN TRIGONOMETRY, by M. J. G. Hearley, $1.75; WEATHER STUDY, by David Brunt, $2.25 (*Ronald Press*).

Science News Letter, October 3, 1942

➤ AGAIN ONE of the best-known of popular biographers undertakes the biography of a geographic region now again very much in history's spotlight. An exceedingly readable book is THE MEDITERRANEAN, Saga of a Sea, by Emil Ludwig (*Whittlesey*, $3.75).

Science News Letter, October 3, 1942

➤ A WORTHY addition to the distinguished series of biological symposia staged by the American Association for the Advancement of Science is made in LEVEL OF INTEGRATION IN BIOLOGICAL AND SOCIAL SYSTEMS, under the editorship of Robert Redfield (*Jaques Cattell Press*, $2.50).

Science News Letter, October 3, 1942

➤ PROBLEMS OF the mechanics of living things are philosophically discussed by a noted British scientist, Sir D'Arcy Wentworth Thompson, in a revised and enlarged edition of GROWTH AND FORM (*Macmillan*, $12.50). One comes away from even a superficial examination of the book with a new appreciation of the old dictum, "God always geometrizes."

Science News Letter, October 3, 1942

➤ THE WAR has caused such a spectacular, if temporary, increase in the birthrate that many of us are apt to forget the number of couples who remain childless against their will. The number is estimated at one in every eight or nine. Happily, one-fourth to nearly one-half of them can be helped to have children by proper treatment. The methods of treatment and of examination to determine the cause of childlessness are described in FACTS FOR CHILDLESS COUPLES, by E. C. Hamblen (*Thomas*, $2). Although addressed to a special group of readers, the book might be read with profit by almost any young couple contemplating matrimony because of its clear explanation of the reproductive functions of men and women.

Science News Letter, October 3, 1942

➤ THROUGH the eyes and ears of a mechanically-minded young boy wandering through broadcasting studios, the reader is informed in ALL ABOUT BROADCASTING, by Creighton Peet (*Alfred A. Knopf*, $1.75). In the control and transmitting rooms, engineers explain it all to him, and the author's camera helps the reader to visualize what the boy saw.

Science News Letter, October 3, 1942

➤ THE FIRST volume in what will undoubtedly prove to be an invaluable reference book for systematic ornithologists is CATALOGUE OF BIRDS OF THE AMERICAS AND THE ADJACENT ISLANDS IN FIELD MUSEUM OF NATURAL HISTORY (Part I, No. I) by Charles E. Hellmayer and Boardman Conover (*Field Museum of Natural History*, $5). This section covers families from Rheidae to Columbidae.

Science News Letter, October 3, 1942

➤ A GREAT city isn't necessarily the complete blight on nature that we are prone to think it. Many interesting birds are to be found right in Greater New York, many others within a rail ride of an hour or two. Allen D. Cruickshank tells about them in BIRDS AROUND NEW YORK CITY, which is No. 13 in the handbook series (*American Museum of Natural History*, $1.75).

Science News Letter, October 3, 1942

➤ A USEFUL, readable text for students of nursing is PSYCHOLOGY IN NURSING PRACTICE, by Philip Lawrence Harriman, Lela L. Greenwood, and Charles E. Skinner (*Macmillan*, $3.25).

Science News Letter, October 3, 1942

• Books Just Off the Press •

AIRCRAFT SHEET METAL WORKERS' MANUAL—Robert C. Look—*Goodheart-Willcox Co.*, 122 p., illus., $2.50.

BLOOD SUBSTITUTES AND BLOOD TRANSFUSIONS—Stuart Mudd and William Thalhimer—*Charles C. Thomas*, 407 p., illus., $5. Technical, up-to-the-minute as of June 1942.

EDWARD SYLVESTER MORSE—Dorothy G. Wayman—*Harvard Univ. Press*, 457 p., illus., $4.50. Biography of eccentric zoologist with amazing versatile talents.

ELECTRICAL TRANSMISSION AND DISTRIBUTION REFERENCE BOOK—*Westinghouse*, 570 p., illus., $5. A monumental book of importance to the engineers who keep the current flowing, published as a service to the electrical engineering profession.

EXCAVATIONS AT DEIR EL BAHRI—H. E. Winlock—*Macmillan*, 235 p., illus., $5.

THE FARM BOOKKEEPER—Bert V. Tornborgh—*Orange Judd Pub. Co.*, 128 p., $2.

FIELD CROPS AND LAND USE—Joseph F. Cox and Lyman Jackson—*Wiley*, 473 p., illus., $3.75.

A FIRST COURSE IN MATHEMATICS—Edward Baker—*Van Nostrand Co.*, 295 p., diagr., $3.

FRONTIER BY AIR—Alice Rogers Hager—*Macmillan*, 243 p., illus., $3.50. Birds' eye view of our neighbors to the south.

INTRODUCTION TO PARASITOLOGY—A. S. Pearse—*Charles C. Thomas*, 357 p., illus., $3.75. Text for college students.

MAN AND HIS PHYSICAL WORLD—Dwight E. Gray—*Van Nostrand Co.*, 665 p., illus., $3.75.

MAN'S MOST DANGEROUS MYTH: THE FALLACY OF RACE—M. F. Ashley Montagu—*Columbia Univ. Press*, 216 p., $2.25.

A MANUAL OF EXPERIMENTAL EMBRYOLOGY—Viktor Hamburger—*Univ. of Chicago Press*, 213 p., illus., $2.50. Technical.

MECHANICAL PHYSICS—Herbert Dingle—*Ronald Press*, 248 p., charts, $2.25.

MODERN TRIGONOMETRY—M. J. G. Hearley—*Ronald Press*, 168 p., charts, $1.75.

MOUNTAINS—Carroll Lane Fenton and Mildred Adams Fenton—*Doubleday*, 160 p., illus., $2.50. Beauty and information.

PHOTOGRAPHIC EXPOSURE COMPUTER—*American Standards Ass'n*, 24 p., illus., $1. Contains tables and a dial for computing exposures.

PLANT-GROWTH REGULATORS—John W. Mitchell and Ruby R. Rice—*Gov't Print. Office*, 75 p., illus., 20c.

PRIVATE PILOT'S HANDBOOK—A. G. Norwood—*Pitman*, 258 p., illus., $2.50. Based on experiences of an education specialist of C. A. A.

RECONNAISSANCE WORK IN THE UPPER RIO GRANDE VALLEY COLORADO AND NEW MEXICO—E. B. Renaud—*Univ. of Denver Press*, 36 p., illus., 50c.

WEATHER STUDY—David Brunt—*Ronald Press*, 215 p., illus., $2.25.

WIRELESS AND HOW IT WORKS—*Longmans*, 56 p., diagr., 40c. Simple, brief nontechnical explanation.

YOUR CAREER IN ENGINEERING—Norman V. Carlisle—*Dutton*, 253 p., illus., $2.50.